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FRIDAY, AUGUST 23, 1895.

## CONTENTS:

<i>The Relationships and Responsibilities of Museums:</i> G. BROWN GOODE .....	197
<i>The Processes of Life Revealed by the Microscope:</i> SIMON HENRY GAGE.....	209
<i>Consciousness and Evolution:</i> J. MARK BALDWIN.....	219
<i>The Science of Examining:</i> PETER T. AUSTEN.....	223
<i>The 'New Race' in Egyptian History:</i> D. G. BRINTON.....	227
<i>Current Notes on Physiography (XIV.):</i> —.....	228
<i>Foreau's Expedition into the Sahara; Laccolitic Mountain Groups; The Run-off of Rivers:</i> W. M. DAVIS.	
<i>Scientific Notes and News:</i> — .....	229
<i>The British Medical Association; Section C, Chemistry, of the A. A. A. S.; The Botanical Society of America; Vital Statistics of New England; General.</i>	
<i>University and Educational News.</i> .....	233
<i>Correspondence:</i> — .....	234
<i>A New Bibliographical Bureau for Zoölogy:</i> HERBERT HAVILAND FIELD.	
<i>Scientific Literature:</i> — .....	237
<i>Jaccard's Le pétrole, l'asphalte et le bitume:</i> S. F. PECKHAM; <i>Howarth's Glacial Nightmare and the Flood:</i> J. W. SPENCER; <i>Talbot's Etiology of Osseous Deformities:</i> CHARLES L. DANA; <i>Double Refraction in Wood:</i> WILLIAM HALLOCK; <i>Magnetic Declination in Alaska:</i> L. A. BAUER.	

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## THE RELATIONSHIPS AND RESPONSIBILITIES OF MUSEUMS.\*

In an article on 'The use and abuse of Museums,' written nearly fifteen years ago

\* Part of a paper on 'The Principles of Museum Administration,' read before the *Museums Association*, at Newcastle-on-Tyne, July 23, 1895.

by Professor William Stanley Jevons, attention was directed to the circumstance that there was not, at that time, in the English language a treatise analyzing the purposes and kinds of museums, and discussing the general principles of their management and economy. It is somewhat surprising that the need then made so evident has not since been supplied and that there is not at the present day such a treatise in the English or any other language. Many important papers have in the interval been printed in regard to particular classes of museums and special branches of museum work. Notable among these have been those written by Sir William H. Flower, Professor W. A. Herdman, Dr. J. S. Billings, Dr. H. H. Higgins, Dr. Albert Günther and General Pitt Rivers, and there had previously been printed the well known essay of Dr. J. E. Gray, Edward Forbes' suggestive paper on 'Educational Uses of Museums,' in 1853, and the still earlier one by Edward Edwards on 'The Maintenance and Management of Public Galleries and Museums,' printed in 1840.

No one has as yet attempted, however, even in a preliminary way, to formulate a general theory of administration applicable to museum work in all its branches, except Professor Jevons, who, in the paper already referred to, presented in an exceedingly impressive manner certain ideas which should underlie such a theory.

It is still true, as it was when Professor Jevons wrote, in 1881, that there is not in existence 'a treatise analyzing the purposes and kinds of museums and discussing the general principles of their management and economy.' With this fact in mind I have ventured to begin the preparation of such a treatise and to attempt to bring together in one systematic sequence the principles which I believe to underlie the practice of the wisest and most experienced of modern museum administrators.

My ideas are presented, it may be, in a somewhat dogmatic manner, often in the form of aphorisms, and to the experienced museum worker many of them will, perhaps, sound like truisms.

I have had two objects in view:

It has been my desire, in the first place, to begin the codification of the accepted principles of museum administration, hoping that the outline which is here presented may serve as the foundation for a complete statement of those principles, such as can only be prepared through the coöperation of many minds. With this in view, it is hoped that the paper may be the cause of much critical discussion.

My other purpose has been to set forth the aims and ambitions of modern museum practice, in such a manner that they shall be intelligible to the persons who are responsible for the establishment of museums and also to the directors of other public institutions founded for similar purposes, in order to evoke more fully their sympathy and coöperation.

Museums of art and history, as well as those of science, are discussed in this paper, since the same general principles appear to be applicable to all.

The theses proposed are two hundred and fifteen in number and are arranged under the following heads or chapters:

I. The Museum and its Relationship;  
II. The Responsibilities and Requirements

of Museums; III. The Five Cardinal Necessities in Museum Administration; IV. The Classification of Museums; V. The Uses of Specimens and Collections; VI. The Preservation and Preparation of Museum Materials; VII. The Art of Installation; VIII. Records, Catalogues and Specimen Labels; IX. Exhibition Labels and Their Function; X. Guides and Lecturers; Hand Books and Reference-books; XI. The Future of Museum Work.

[The introductory portion, consisting of the first three chapters, and the last chapter are here printed. The remainder of the paper is more technical and is intended especially for the consideration of persons engaged directly in museum work.]

#### THE MUSEUM AND ITS RELATIONSHIPS.

##### A. *The Museum Defined.*

1. A museum is an institution for the preservation of those objects which best illustrate the phenomena of nature and the works of man, and the utilization of these for the increase of knowledge and for the culture and enlightenment of the people.

##### B. *The Relation of the Museum to other Institutions of Learning.*

1. The Museum in its effort for the increase and diffusion of knowledge aids and is aided by (a) the university and college, (b) the learned society and (c) the public library.

2. The special function of the museum is to preserve and utilize objects of nature and works of art and industry; that of the library to guard the written records of human thought and activity; that of the learned society to discuss facts and theories; that of the school to educate the individual, while all meet together on common ground in the custodianship of learning and in extending the boundaries of existing knowledge.

3. The care and utilization of material objects being the peculiar duty of the mu-

seum, it should not enter the field of other institutions of learning, except to such a degree as may be found absolutely necessary in connection with its own work.

[For example, its library should contain only such books as are necessary for use within its own walls. Its publications should be solely those which are (directly or indirectly) the outgrowth of its own activities. Its teaching work should be such as cannot be performed by other institutions.]

On the other hand, schools may advantageously limit their cabinets with reference to the needs of their lecture rooms and laboratories. The library and the learned society should not enter the field of the museum, except in localities where museum agencies are not provided.]

#### C. *The Relation of the Museum to the Exposition.*

1. The Museum differs from the Exposition both in its aims and in the method of its activity.

2. The Exposition, or Exhibition, and the Fair are primarily for the promotion of industry and commerce; the Museum for the advancement of learning.

3. The principal object of the former is to make known the names of the exhibitors for their own professional or financial advantage; in the latter the name of the exhibitor is incidental, the thing chiefly in mind being the lesson taught by the exhibit.

4. Into the work of the former enters the element of competition, coupled with a system of awards by diplomas or medals; in that of the latter the element of competition does not appear.

5. The educational results of expositions, though undeniably important, are chiefly incidental, and not at all proportionate to the prodigal expenditure of energy and money which are inseparable from any great exposition.

#### D. *Museum Features Adopted in Expositions.*

1. Museum methods have been in part adopted by many expositions, in some instances to attract visitors, in others because it has been desired to utilize the occasion to give museum lessons to multitudes to whom museums are not accessible.

2. Those expositions which have been most successful from an educational standpoint have been the ones which have most fully availed themselves of museum methods, notably the London Exhibition of 1851 and the Paris Exposition of 1889.

3. Special or limited exhibitions have a relatively greater educational value, owing to the fact that it is possible in these to apply more fully the methods of the museum. Examples of this principle were afforded by the four expositions held in London from 1883 to 1886—Fisheries, Health, Inventions and Colonial.

4. The annual exhibitions of the academies of art are allied to the exposition rather than to the museum.

5. Many so-called 'museums' are really 'permanent exhibitions,' and many a great collection of pictures can only be suitably described by the name 'picture gallery.'

#### E. *Temporary Museums.*

1. There are many exhibitions which are administered in accordance with museum principles and which are really temporary museums. To this class belong the best of the loan exhibitions, and also special exhibits made by public institutions, like the 'Luther Memorial Exhibition' of 1874, the material for which was derived chiefly from the Library of the British Museum, and similar exhibitions subsequently held under the same auspices.

#### F. *Museum Methods in other Institutions—'Museum Extension.'*

1. The zoölogical park, the botanical garden and the aquarium are essentially mu-

seums, and the principles of museum administration are entirely applicable to them.

2. An herbarium in its usual form corresponds to the study series in a museum, and is capable of expansion to the full scope of the general museum.

3. Certain churches and ecclesiastical edifices and classical antiquities in place, when they have been pronounced 'public monuments,' are subject to the principles of museum administration.

4. Many cities, like Rome, Naples, Milan and Florence, by reason of the number of buildings, architectural features, sculpture and other objects in the streets and squares, together with the historical houses duly labeled by tablets, have become practically great museums, and these various objects are administered much in the manner of museums. Indeed, the number of 'Public Monuments' in Italy is so great that the whole country may properly be described as a museum of art and history. A government commission for the preservation of the monuments of history and art regulates the contents of every church, monastery and public edifice, the architectural features of private buildings, and even private collections, to the extent of requiring that nothing shall be removed from the country without governmental sanction. Each Italian town is thus made a museum, and in Rome the site of the Forum and the adjacent ancient structures has been set aside as an outdoor museum under the name of the *Passegiata Archeologica*.

Similar government control of public monuments and works of art exists in Greece and Egypt, and in a lesser degree in the Ottoman Empire, and for half a century there has been a Commission of Historic Monuments in France, which has not only succeeded in protecting the national antiquities, but has published an exceedingly important series of descriptive monographs concerning them.

#### THE RESPONSIBILITIES AND REQUIREMENTS OF MUSEUMS.

##### A. *The Relation of the Museum to the Community.*

1. The museum meets a need which is felt by every intelligent community and furnishes that which cannot be supplied by any other agency. The museum does not exist except among enlightened peoples, and attains its highest development only in great centres of civilization.

2. The museum is more closely in touch with the masses than the university and learned society, and quite as much so as the public library, while, even more than the last, it is a recent outgrowth of modern tendencies of thought. Therefore,

3. THE PUBLIC MUSEUM IS A NECESSITY IN EVERY HIGHLY CIVILIZED COMMUNITY.

##### B. *The Mutual Responsibilities of the Community and the Museum.*

1. The museums in the midst of a community perform certain functions which are essential to its welfare, and hence arise mutual responsibilities between the community and the museum administrator.

2. The museum administrator must conduct his work with the highest possible degree of efficiency, in order to retain the confidence of the community.

3. The community should provide adequate means for the support of the museum.

4. A failure on the part of the one must inevitably lead to a corresponding failure on the part of the other.

##### C. *The Specific Responsibilities of the Museum.*

1. The museum should be held responsible for special services, chiefly as follows:

a. *For the advancement of learning.*—To aid learned men in the work of extending the boundaries of knowledge, by affording them the use of material for investigation, laboratories and appliances.

To stimulate original research in connection with its own collections, and to promote the publication of the results.

b. *For record.*—To preserve for future comparative and critical study the material upon which past studies have been made, or which may serve to confirm, correct or modify the results of such studies. Such materials serve to perpetuate the names and identifications used by investigators in their publications and, thus authenticated, to serve as a basis for future investigation in connection with new material. Specimens which thus vouch for the work of investigators are called *Types*. Besides types museums retain for purposes of record many specimens which, though not having served for investigation, are landmarks for past stages in the history of man and nature.

c. *As an adjunct to the class room and the lecture room.*—To aid the teacher either of elementary, secondary, technological or higher knowledge in expounding to his pupils the principles of art, nature and history, and to be used by advanced or professional students in practical laboratory or studio work.

To furnish to the advanced or professional student materials and opportunity for laboratory or studio training.

d. *To impart special information.*—To aid the occasional inquirer, be he a laboring man, school boy, journalist, public speaker or savant, to obtain, without cost, exact information upon any subject related to the specialities of the institution; serving thus as a 'bureau of information.'

e. *For the culture of the public.* To serve the great general public, through the display of attractive exhibition series, well-planned, complete and thoroughly labeled; and thus to stimulate and broaden the minds of those who are not engaged in scholarly research, and draw them to the public library and the lecture room. In

this respect the effect of the museum is somewhat analogous to that of travel in distant lands.

2. A museum to be useful and reputable must be constantly engaged in aggressive work, either in education or investigation, or in both.

3. A museum which is not aggressive in policy and constantly improving cannot retain in its service a competent staff and will surely fall into a decay.

4. A FINISHED MUSEUM IS A DEAD MUSEUM, AND A DEAD MUSEUM IS A USELESS MUSEUM.

5. Many so-called 'museums' are little more than storehouses filled with the materials of which museums are made.

#### D. *The Responsibility of Museums to Each Other.*

1. There can be no occasion for envious rivalry between museums, even when they are in the same city. Every good museum strengthens its neighbors and the success of the one tends to the popularity and public support of the others.

2. A system of coöperation between museums, by means of which much duplication of work and much expenditure of work may be avoided, is seemingly possible.

3. The first and most important field for mutual understanding is in regard to specialization of plan. If museums in the same town, province or nation would divide the field of work so that each should be recognized as having the first rights in one or more specialities, rivalry would be converted into friendly association and the interests of science and education better served.

4. An important outcome of such a system of coöperation might be the transfer of entire groups of specimens from one museum to another. This would greatly facilitate the work of specialization referred to, and at the same time relieve each museum of the responsibility of maintaining collec-

tions which are not germane to its real purpose. Such transfers have occasionally been made in the past, and there are few museums which might not benefit individually, in a large degree, by a sweeping application of this principle. If its effect upon the effectiveness and interest of any local or national group of museums is taken into account, no one can doubt that the result would be exceedingly beneficial.

5. Another field for coöperation is in joint expenditure of effort and money upon labels and catalogues and in the economical purchase of and in supplies and material.

6. Still another would lie in the coöperative employment of expert curators and preparators, it being thus practicable to pay larger salaries and secure better men.

#### THE FIVE CARDINAL NECESSITIES IN MUSEUM ADMINISTRATION.

##### *The Essentials of Success in Museum Work.*

A museum cannot be established and creditably maintained without adequate provision in five directions:

1. A stable organization and adequate means of support.

2. A definite plan, wisely framed in accordance with the opportunities of the institution and the needs of the community for whose benefit it is to be maintained.

3. Material to work upon—good collections or facilities for creating them.

4. Men to do the work—a staff of competent curators.

5. Appliances to work with—a suitable building, with proper accessories, installation material, tools and mechanical assistants.

##### A. *Stability of Organization.*

1. The only absolute assurance of permanence for a museum lies either in governmental protection, in a connection with some endowed institution of learning, or in special organization with ample endowments.

2. The cabinets of unendowed societies, or those gathered and supported by the efforts of individuals, must in time inevitably be dispersed or destroyed.

##### B. *Definiteness of Plan.*

1. No two museums can be or ought to be exactly alike. Each should be devoted to one or more special subjects, and should select those subjects not only in reference to opportunity and the needs of the community, but also with regard to the specialties of other museums in the same region, with a view to coöperation.

2. It is the duty of every museum to be preëminent in at least one specialty, be this specialty never so limited.

3. The specialties or departments of any museum may be few or many, but it is important that its plan should be positively defined and limited, since lack of purpose in museum work leads in a most conspicuous way to waste of effort and to failure, partial or complete.

4. It will undoubtedly be found desirable for certain museums, founded for local uses, to specialize mainly in the direction of popular education. If these cannot also provide for a certain amount of scholarly endeavor in connection with their other activities, it is of the utmost importance that they should be associated (by a system of administrative coöperation) with some institution which is a centre of original work.

5. The general character of a museum should be clearly determined at its very inception. Specialization and division of labor are essential for institutions as well as for individuals. It is only a great national museum which can hope to include all departments and which can with safety encourage growth in every direction.

6. Small museums, it is needless to say, cannot attempt specialization in the same degree as large ones, but the principles just

enunciated should be constantly kept in view, even by the least of them.

### C. Collections.

1. The sources of collections are the following: (a) By gift; (b) by purchase; (c) by exchange; (d) by collection and exploration; (e) by construction; (f) through deposit or temporary loan.

a. *By gift*.—Acquisition by gift is a most important source, but very uncertain. If a museum has a plan to which it intends to adhere, a large proportion of the gifts offered to it will be unavailable; while, on the other hand, only a small proportion of the desiderata will ever be thus obtained. A museum may properly, by the offer of a large and complete collection illustrating a subject outside of its plan, be induced to expand its scope. In the case of a large benefaction of this kind, necessitating extensive changes in installation, there must always be careful consideration of the result. It should be borne in mind, however, that the random, thoughtless acceptance of proffered gifts, which in the course of a few years produces results by no means insignificant in the consumption of space and money for their care, may modify the plan of a museum in a most radical manner. It requires quite as much judgment and mental effort on the part of a museum officer to keep out unsuitable objects as to bring in those which are desirable.

b. *By purchase*.—Acquisition by purchase is often the only means of obtaining desirable objects, particularly so in the case of art museums, least so in natural history museums. Money is especially necessary for the filling of gaps in series obtained by gift or otherwise.

c. *By exchange*.—Acquisition by exchange is especially advantageous, since it enables a museum to dispose of unavailable duplicate material. When exchanges are made with well-conducted museums there is the

additional advantage that the materials thus obtained have been studied and identified by expert authorities. Little is gained by conducting exchanges in a commercial spirit and in insisting on too exact valuations and balancing of equivalents, especially when the parties to the exchange are public institutions. Large museums in dealing with small ones may often advantageously give largely and receive comparatively little in return, since they not only become disembarrassed of useless duplicates not desired by institutions of equal rank, but are also building up sister institutions which may in time afford them much more substantial aid. Exchanges with private collectors may well be carried on in the same spirit, since the collector is thus encouraged to gather more material, in the midst of which unexpected treasures may come to light, and is also aided to build up a private collection which in time will probably fall into the hands of some public museum.

d. *By collecting and exploration*.—For all museums save those of art this is usually the most profitable and satisfactory, since by gathering fresh material in unexplored fields, new facts are discovered, science is enriched, and the reputation of the institution improved. Furthermore, material is obtained in such large quantities that there always remains much in the way of duplicate specimens valuable for exchange. A museum which carries its activities into unexplored fields secures for itself material which is unique and unobtainable by others, and thus makes itself a centre of interest for the entire world.

The smallest museum may enrich its collections by modest explorations under its own walls; it can do much by simply encouraging the people in the adjacent region to save what they accidentally encounter in the course of their daily pursuits. Explorations of this kind are preëminently the function of local and provincial museums.



e. *By construction.*—Any museum may do much to improve its exhibition series by the construction of models and the making of drawings and maps and by taking copies of important objects in its own collections, to secure material to be used in exchange. Even small museums may do this, for extensive workshops are not necessary and a specialist, himself devoid of mechanical skill, may accomplish marvelous things with the aid of a patient mechanic.

f. *Through deposit and temporary loan.*—Possessors of private collections will often lend them for purposes of exhibition or study, if assured that they will be properly cared for. Such loan collections often become permanent gifts. Single specimens, or small groups of objects, are still more frequently offered on deposit, and such deposits, when within the province of the museum, should be encouraged.

[In the United States National Museum small deposits are received for short periods, but large collections involving trouble and expense in installation, only with the understanding that they shall not be removed within a certain period—never less than two years.]

2. Collections which are encumbered by conditions as to manner of disposition and installation are usually sources of serious embarrassment. It is especially undesirable to accept either as a gift or as a loan any unimportant collection with the pledge that it shall be kept intact and installed as a unit. The acceptance of any collection, no matter how important, encumbered by conditions, is a serious matter, since no one can foresee how much these conditions may interfere with the future development of the museum.

3. Gifts, deposits and coöperation of all kinds may be greatly encouraged by liberal acknowledgment upon labels and in public reports. This is but simple justice to the generosity of the benefactor. It is also a

legitimate way to gratify a natural and and praiseworthy sentiment; for a collection to the accumulation of which a man has devoted a lifetime becomes so connected with his own personality that it is but natural that he should wish his name to be permanently associated with it. If acknowledgment of this kind is made upon the individual label of each specimen, this will usually fully satisfy the desire of the donor that the individuality of his gift should be preserved—an arrangement much more satisfactory than a plan requiring that the objects shall be kept together and treated as a unit of installation.

Gifts and deposits are also encouraged by the fact that the buildings are fire-proof, the cases so built as to afford perfect protection, and the scheme of installation dignified and attractive. Collections of great value may well be afforded accommodations of a specially sumptuous character and such protection, in the case of priceless objects, as is afforded by special electric attachments.

4. Since the plan and character of a museum is largely determined for all time by the nature of the collections which fall first into its possession, at the time of its organization, the authorities in charge of such an institution at the time of organization should be exceedingly careful in accepting materials which are to serve as a nucleus for its future growth.

[It is not unusual for boards of trustees, having erected a building, to proceed at once to partially fill it with showy material before the staff has been appointed or a plan considered. This can only be characterized as pernicious activity which is certain to result in more harm than good. A plan having been determined upon and a director selected, the collections may be developed with much less expenditure and with any degree of rapidity which may be desired.]

*D. Museum Officers.*

1. A museum without intelligent, progressive and well-trained curators is as ineffective as a school without teachers, a library without librarians, or a learned society without a working membership of learned men.

2. Museum administration has become one of the learned professions, and success in this field can only be attained as the result of years of study and experience in a well-organized museum. Intelligence, a liberal education, administrative ability, enthusiasm, and that special endowment which may be called 'the museum sense' are prerequisite qualifications.

Each member of the museum staff should become an authority in some special field of research, and should have time for investigation and opportunity to publish its results.

3. A museum which employs untrained curators must expect to pay the cost of their education in delays, experimental failures and waste of materials.

4. No investment is more profitable to a museum than that in its salary fund, for only when this is liberal may the services of a permanent staff of men of established reputation be secured.

Around the nucleus of such a staff will naturally grow up a corps of volunteer assistants, whose work properly assisted and directed will be of infinite value.

5. Collaborators, as well as curators, may be placed upon the staff of a large museum, the sole duty of the former being to carry on investigations, to publish, and, if need be, to lecture.

6. Volunteers may be advantageously employed either as curators and custodians, or collaborators. Such coöperation is especially desirable and practicable when a museum is situated in the same town with a college or university, or in a national capital where there are scientific bureaus

connected with the government. Professors in a university or scientific experts in the government service often find it a great benefit to have free access to the facilities afforded by a museum, and are usually able to render useful service in return. Younger men in the same establishments may be employed as volunteer aids, either in the museum or in the field.

7. No man is fitted to be a museum officer who is disposed to repel students or inquirers, or to place obstacles in the way of access to the material under his charge.

8. A museum officer or employee should, for obvious reasons, never be the possessor of a private collection.

9. The museum which carries on explorations in the field as a part of its regular work has great advantage over other institutions in holding men of ability upon its staff and in securing the most satisfactory results from their activities. No work is more exhaustive to body and mind than the care of collections, and nowhere are enthusiasm and abundant vitality more essential. Every museum must constantly obtain new material through exploration, and it is better that this exploration should be done by the men who are to study the collections and arrange them in the museum than that this work should be placed in the hands of others.

10. In a large museum staff it is almost essential that certain persons should give their attention chiefly to administrative and financial matters, thus leaving their associates free from occupation of this description. The business affairs of a museum cannot be conducted with too great promptness and precision. It is desirable, however, that the administrative officers of a museum should be men who comprehend the meaning of museum work and are in sympathy with its highest aims, and that its business affairs and scientific work should be controlled by the same executive head.

### E. *Museum Buildings.*

1. The museum building should be absolutely fire-proof and substantially constructed; the architecture simple, dignified and appropriate—a structure worthy of the treasures to be placed within.

2. Above all things the interior should be well lighted and ventilated, dry and protected from dust. The halls should be well proportioned, the decoration simple and restful to the eye. No decorative features should be permitted which might draw attention from the collections or reduce the floor or wall space.

3. While the museum building should be planned with reference to the character of the collections it is to contain, the fact that unexpected development of rapid growth in some one direction may necessitate the rearrangement and reassignment of halls to different departments should always be kept in mind.

4. Since no two museums can be alike, there can be no general uniformity in their buildings. It is manifestly undesirable then that a board of trustees should erect a building for a museum before its character is decided upon or its staff appointed; or that the opinion of the architect of a museum building should be allowed to outweigh the judgment of the experts who are responsible for its utilization after completion. Museum architecture affords no exception to the principle that an edifice should be perfectly adapted to the purpose for which it is designed. No architectural effect which lessens the usefulness of the building can be pleasing to an intelligent public.

### F. *Accessories to Museum Work.*

1. A well-equipped museum requires as accessories to its work:

a. A reference library for the use of staff, students and visitors.

b. Laboratories for the classification of

material, for the storage of the study-series, and for the use of students and investigators.

c. Workshops, for preparation, mounting and repair of specimens, and the making and adjustment of mounts and cases, and storage rooms for material not yet available. A printing press is a most essential feature.

d. An assembly hall, for public lectures, society meetings and special exhibitions.

e. A bulletin, or other official publication, to preserve the history of its activities, to maintain its standing among similar institutions, to serve as a means of communication with correspondents, and to exchange for specimens and books for the library.

2. In addition to local accessories, the opportunity for exploration and field work are equally essential, not only because of considerations connected with the efficiency of the staff, but for the general welfare of the institution. Other things being equal, exploration can be carried on more effectively by the museum than by any other institution of learning, and there is no other field of research which it can pursue to better advantage.

### THE FUTURE OF MUSEUM WORK.

#### A. *The Growth of the Museum Idea.*

1. There can be no doubt that the importance of the museum as an agency for the increase and diffusion of knowledge will be recognized so long as interest in science and education continues to exist. The prediction of Professor Jevons in 1881, that the increase in the number of museums of some sort or other must be almost coextensive with the progress of real popular education, is already being realized. Numerous local museums have been organized within the past fifteen years in the midst of new communities. Spécial museums of new kinds are developing in the old centres, and every university, college and school is organizing

or extending its cabinet. The success of the Museums' Association in Great Britain is another evidence of the growing popularity of the museum idea, and similar organizations must of necessity soon be formed in every civilized country.

2. With this increase of interest there has been a corresponding improvement in museum administration. More men of ability and originality are engaging in this work, and the results of this are manifest in all its branches.

The museum recluse, a type which had many representatives in past years, among them not a few eminent specialists, is becoming much less common, and this change is not to be regretted. The general use of specimens in class-room instruction and, still more, the general introduction of laboratory work in the higher institutions, has brought an army of teachers into direct relations with museum administration, and much support and improvement has resulted.

3. Museum administration has become a profession, and the feeling is growing more and more general that it is one in which talents of a high order can be utilized. It is essential to the future development of the museum that the best men should be secured for this kind of work, and to this end it is important that a lofty professional standard should be established.

#### *B. Public Appreciation of the Material Value of Collections.*

1. The museum of nature or art is one of the most valuable material possessions of a nation or a city. It is, as has well been said, 'the people's vested fund.' It brings not only world-wide reputation, but many visitors and consequent commercial advantage. What Alpine scenery is to Switzerland, museums are to many neighboring nations. Some one declares that the Venus of Melos has attracted more wealth to Paris than the Queen of Sheba brought to King

Solomon, and that but for the possession of their collections (which are intrinsically so much treasure) Rome and Florence would be impoverished towns.

This is thoroughly understood by the rulers of modern Italy. We are told that the first act of Garibaldi after he had entered Naples in 1860 was to proclaim the city of Pompeii the property of the nation, and to increase the appropriation for excavations so that these might be carried on with greater activity. He appreciated the fact that a nation which owns a gold mine ought to work it, and that Pompeii could be made for Naples and for Italy a source of wealth more productive than the gold mines of Sacramento. If capital is an accumulation of labor, as economists say, works of art which are the result of the highest type of labor must be capital of the most productive character. A country which has rich museums attracts to itself the money of travelers, even though it may have no other source of wealth. If, besides, the populace is made to understand the interest which is possessed by their treasures of art they are inspired with the desire to produce others of the same kind, and so, since labor increases capital, there is infinite possibility for the growth of national prosperity. It is evident then that too much money cannot be devoted to the formation of museums, to their maintenance, and to the education of the people by this means.

Suggestive in this same connection is this remark of Sir William Flower to the effect that the largest museum yet erected, with all its internal fittings, has not cost so much as a single fully equipped line of battleships, which in a few years may be either at the bottom of the sea or so obsolete in construction as to be worth no more than the material of which it is made.

This principle was well stated more than half a century ago by Edward Edwards in his treatise on the 'Administrative Econ-

omy of the Fine Arts in England,' as follows :

"In addition to the broad principle that public funds can never be better employed than in the establishment of institutions tending at once to refine the feelings and to improve the industry of the whole population, there is the subordinate but yet important ground of inducing and enabling private persons greatly to benefit the public by contributing towards the same end."

"No country," he continues, "has more cause to be proud of that munificent spirit of liberality which leads private individuals to present or bequeath to the community valuable collections which it has been the labor of their lives to form; but to give due effect to this liberality and to make that effect permanent, it is necessary that the state step in and contribute its sanction and its assistance; and in many cases the very munificence of spirit which has formed an immense collection, and given birth to the wish to make it national, has, by its own excess, made that wish powerless without the active aid of the legislature. The actual cost, and still more the inherent value of the collections of Sloane, Elgin and Angerstein, made them in reality gifts to the nation, although they could never have been acquired (without gross injustice to the descendants of the large minded collectors) had not Parliament made certain pecuniary advances on account of them. Whilst but for the foundation of the British Museum and of the National Gallery, the collections of Cracherode and Holwell Carr, of Beaumont, of Sir Joseph Banks and of King George III., would have continued in the hands of individuals."

### C. *Public Appreciation of the Higher Function of Museums.*

1. Museums, libraries, reading rooms and parks have been referred to by some wise person as 'passionless reformers,' and no better term can be employed to describe one of the most important of their uses.

The appreciation of the utility of museums to the great public lies at the foundation of what is known as 'the modern museum idea.' No one has written more eloquently of the moral influence of museums than Mr. Ruskin, and whatever may be thought of the manner in which he has carried his ideas into practice in his workmen's museum, near Sheffield, his influ-

ence has undoubtedly done much to stimulate the development of the 'people's museum.' The same spirit inspired Sir Henry Cole when he said to the people of Birmingham in 1874:

"If you wish your schools of science and art to be effective, your health, your air and your food to be wholesome, your life to be long and your manufactures to improve, your trade to increase and your people to be civilized, you must have museums of science and art to illustrate the principles of life, wealth, nature, science, art and beauty."

I myself never shall forget the words of the late Sir Philip Cunliffe Owen, of South Kensington, who said to me some years ago:

"We educate our working people in the public schools, give them a love for refined and beautiful objects, and stimulate in them a desire for information. They leave school, go into the pursuits of town life, and have no means provided for the gratification of the tastes which they have been forced to acquire, and are condemned to a monotonous, depressing life in the midst of smoky chimneys and dingy walls. It is as much the duty of the government to provide them with museums and libraries for higher education as it is to establish schools for their primary instruction."

The development of the modern museum idea is indeed due to Great Britain in much greater degree than to any other nation, and the movement dates from the period of the great Exhibition of 1851, which marked an epoch in the intellectual progress of English speaking peoples.

2. The future of the museum, as of all similar public institutions, is inseparably associated with the continuance of modern civilization, by means of which those sources of enjoyment which were formerly accessible to the rich only are now, more and more, placed in the possession and ownership of all the people (an adaptation of what Jevons has called 'the principle of the multiplication of utility') with the result that objects which were formerly accessible only to the wealthy, and seen by a very small number of people each year, are now held in common ownership and enjoyed by hundreds of thousands.

In this connection the maintenance of museums should be especially favored, because, as has been shown, these, more than any other public agency, are invitations to the wealthy owners of private treasures, in the form of collections, to give them in perpetuity to the public.

3. If it be possible to sum up in a single sentence the principles which have been discussed in the present paper, that sentence should be phrased in these words:

THE DEGREE OF CIVILIZATION TO WHICH ANY NATION, CITY OR PROVINCE HAS ATTAINED IS WELL INDICATED BY THE CHARACTER OF ITS PUBLIC MUSEUMS AND THE LIBERALITY WITH WHICH THEY ARE SUPPORTED.

G. BROWN GOODE.

U. S. NATIONAL MUSEUM.

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*THE PROCESSES OF LIFE REVEALED BY THE MICROSCOPE: A PLEA FOR PHYSIOLOGICAL HISTOLOGY.\**

It is characteristic of the races of men that almost at the dawn of reflection the first question that presses for solution is this one of life; life as manifested in men and in the animals and plants around them. What and whence is it and whither does it tend? Then the sky with its stars, the earth with its sunshine and storm, light and darkness, stand out like great mountain peaks demanding explanation. So in the life of every human being, repeating the history of its race, as the evolutionists are so fond of saying, the fundamental questions are first to obtrude themselves upon the growing intelligence. There is no waiting, no delay for trifling with the simpler problems; the most fundamental and most comprehensive come immediately to the fore and alone seem worthy of consideration. But as age advances most men learn to ignore the fundamental questions and to sat-

isfy themselves with simpler and more secondary matters as if the great realities were all understood or non-existent. No doubt to many a parent engaged in the affairs of society, politics, finance, science or art, the questions that their children put, like drawing aside a thick curtain, bring into view the fundamental questions, the great realities; and we know again that what is absorbing the power and attention of our mature intellect, what perhaps in pride we feel a mastery over, are only secondary matters after all, and to the great questions of our own youth, repeated with such earnestness by our children, we must confess with humility that we still have no certain answers. It behooves us then, if the main questions of philosophy and science cannot be answered at once, to attempt a more modest task and by studying the individual factors of the problem to hope ultimately to put these together and thus gain some just comprehension of the entire problem.

This address is therefore to deal, not with life itself, but with some of the processes or phenomena which accompany its manifestations. But it is practically impossible to do fruitful work according to the Baconian guide of piling observation on observation. This is very liable to be a dead mass devoid of the breath of life. It is a well known fact that the author of the *Novum Organum*, the key which Bacon supposed would serve as the open-sesame of all difficulties and yield certain knowledge, this potent key did not unlock many of the mysteries of science for its inventor. Every truly scientific man since the world began has recognized the necessity of accurate observation, and no scientific principle has ever yet been discovered simply by speculation; but every one who has really unlocked any of the mysteries of nature has inspired, made alive, his observations by the imagination, he has, as Tyndall so well put it, made a scientific use of the

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\* Presidential address delivered before the American Microscopical Society, Wednesday evening, Aug. 21, 1895.